Multinational Factoryless Goods Producers and Expansion of Wholesale and Retail Industry in Korea

Jung Hur
Sogang University
Seoul, Korea

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미래성장연구소 세미나

Motivation

- As global value chains (GVC) in the world economy had been deepened, we have witnessed **an emergence of Multinational Factoryless Goods Producers (MFGPs)**.

- MFGPs

At home, they are sales firms with R&D and marketing technology. At foreign countries, they are producers of their own brand products.

Bernard and Fort (2015) and Morikawa (2016) found that MFGPs are larger, more productive and more R&D

Example of Non-MFGP in Clothing Retail Sector

Sales of domestic brand produced by other firms

Sales of imported foreign brand

Note: If a firm produces its own brand product and sells it, it is a manufacturing firm.

We do not include these firms in this study.

Example of MFGP in Clothing Retail Sector

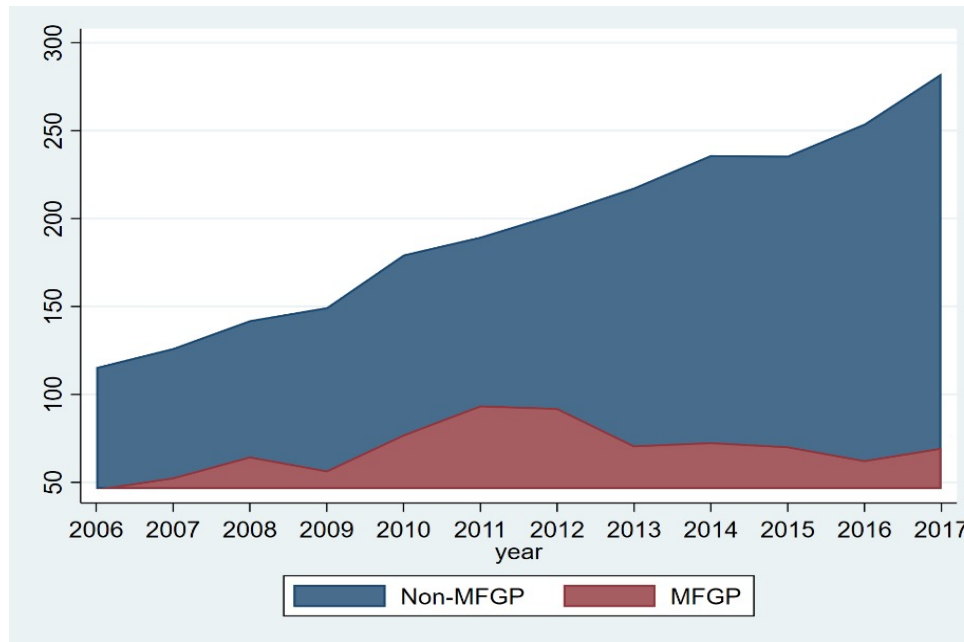Sales of brand produced by its own manufacturing factory located in foreign countries.

→ **Multinational Factoryless Goods Producers**

Total Sales Trend in Wholesales and Retail Industry of Korea

Note. The summation numbers are calculated from Survey of Business Activity (SBA) data from Korea Statistics for fiscal years 2006-2017. The unit is KRW 1 billion won for y-axis, and year for x-axis.

Research Questions

Did the emergence of MFGPS influence the expansion of the Non-MFGPs in the wholesale and retail industry in Korea?

Two opposing effects

(1)   MFGPs may weaken the sales of Non-MFGPs because MFGPs are superior in competition. (negative effect)

(2)   MFGPs may vitalize the sales of Non-MFGPs if Non-MGPs may mimic the advanced marketing technology (positive effect)

Aghion et al (2005)

If the technology gaps are large, firms may not compete each other. Thus the positive effect may dominate the negative effect.

→ We test whether the emergence of the MFGPs increases the growth of non-MFGPs positively.

Related Literature

(1) Literature on MFGPs characterizes MFGPs as larger, more productive, more R&D. But, did not conduct a further analysis.

: Bernard and Fort (2015), Morikawa (2016)

(2) Our study is related to the one that examined the effect of large super market effect such as Wal-mart, Big Mart, Super-Supper-Market. But, mainly focused on effects on job creation and destruction in a region.

: Basker (2005), Neumark et al. (2006), Igami (2011), Cho et al. (2015)

We differ in that:

(1) We highlight the importance of the service GVC by defining the MFGPs as firms that have an internal linkage of foreign manufacturing unit and domestic sales service unit.

(2) We conduct a further analysis on (a) spillover effect and (b) creative destruction effect of MFGPs on non-MFGPs within the wholesale and retail industry.

(3) These two effects may explain the expansion of the wholesale and retail industry in Korea.

Korean Data: Firm-Establishment Matching

- Firm: **Survey of Business Activities**
  - Firm-level data for all industries
  - Firms with 50 or more employees
  - Firm characteristics including foreign activities of firms
  - **Foreign affiliates: country, industry, ownership of total assets**

- Establishment: **Census of Establishments**
  - All establishments with 1 or more employees in all industries
  - Establishment characteristics: employment and industry

→ When they are matched, we can find out establishments or plants that service firms own.

MFGPs in Wholesales and Retail industry in Korea

(1) Numbers of MFGPs versus Non-MFGP

MFGP

(1) only 7% of total numbers

(2) own 2.7 foreign manufacturing units

Non-MFGP

(1) Growing faster and majority

(2) Not own manufacturing units

Year	MFGPs	Foreign manufacturing subsidiary owned by MFGPs	Non-MFGPs	Total (MFGPs + Non-MFGPs)
2008	70	184	772	842
2009	77	187	786	863
2010	69	178	1,031	1,100
2011	64	189	1,046	1,110
2012	80	218	1,088	1,168
2013	79	214	1,150	1,229
2014	91	243	1,179	1,367
Total	530	1,413	7,149	7,679

Notes: The figures are calculated from the *SBA* dataset.

(2) Numbers of Entry stores and Exit stores for MFGPs and Non-MFGPs

MFGP

: Open 3.2 stores
and close 2.9 stores

Non-MFGP

: Open 2.5 stores
and close 1.1 stores

(1) A greater store-
turnover rate of
MFGPs

(2) A greater net
store expansion
of Non-MFGPs

Year	MFGPs		Non-MFGPs	
	# of entrant store	# of exiter store	# of entrant store	# of exiter store
2009	303	188	1945	784
2010	270	250	2895	1148
2011	225	303	2652	1665
2012	330	237	2984	1222
2013	193	202	2666	1386
2014	398	383	4925	1858
Total	1719	1563	18067	8063

Notes: The figures are calculated from the *SBA* and *CE* data.

Following Davis *et al*. (1996), we define an entrant (store) of a firm as a store which exists in year *t* but does not exist in the previous year *t-1*. Similarly, an exiter (store) of a firm is defined as a store which exists in year *t-1* but does not exist in the next year *t*.

(3) Innovation Activities of MFGPs and Non-MFGPs

MFGP

Higher productivity (3.2 times)

Larger R&D (8.7 times)

More Patents (7.2 times)

More Trade marks, (5.7 times)

Larger intangible assets (5 times)

	Productivity		R&D		Patent		Trade Mark		Intangible asset	
	MFGP	Non	MFGP	Non	MFGP	Non	MFGP	Non	MFGP	Non
2008	21.8	7.2	33.3	6.4	23.5	1.7	120.7	12.8	63.5	33.3
2009	21.8	7.7	25.4	4.8	14.2	1.5	115.2	9.4	40.8	32.2
2010	28.8	8.4	39.3	3.5	24.5	6.1	173.5	30.3	163.6	33.1
2011	28.3	8.7	44.9	3.8	41.5	6.3	201.8	32.1	264.7	40.2
2012	23.0	8.3	49.4	2.9	33.3	4.6	151.0	34.7	265.5	42.4
2013	30.0	8.1	29.4	2.9	14.5	1.2	67.8	16.5	264.0	34.9
2014	26.9	8.0	24.9	4.1	12.3	1.2	57.4	19.6	223.4	37.1
Average	25.8	8.1	35.2	4.1	23.4	3.2	126.8	22.2	183.6	36.2

Notes: The figures are calculated from the *SBA*.

Productivity = Sales/Workers per firm; R&D=Expenditure on R&D per firm; Patent = number of patents per firm; Trade Mark = number of Trade marks per firm; Intangible asset = value of intangible asset per firm. Unit for Productivity, R&D and Intangible assets is KRW 100 million.

Spillover effect on Productivity of non-MFGPs
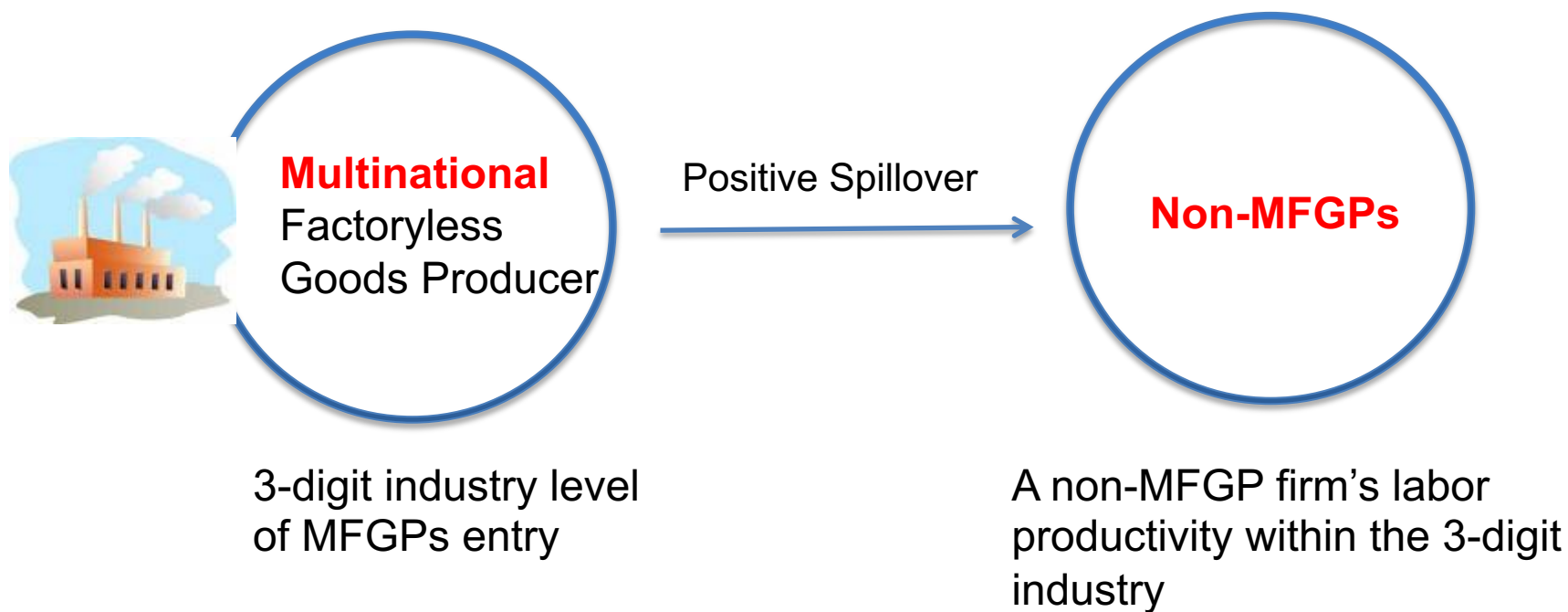
Multinational
Factoryless
Goods Producer

Positive Spillover →

Non-MFGPs

3-digit industry level
of MFGPs entry

A non-MFGP firm's labor
productivity within the 3-digit
industry

Productivity Spillover Effect

- Impact of MFGPs on Non-MFGP's growth

$$\Delta lny_{it}^{Non-MFGP}$$

$$= \beta_0 + \beta_1 Entry\ rate_{k(t-1)}^{MFGP} + \gamma Entry\ rate_{k(t-1)}^{Non-MFGP} + \rho lny_{i(t-1)}^{Non-MFGP}$$

$$+\delta_i + \delta_t + \varepsilon_{it}$$

Dependent Variable

$\Delta lny_{it}^{Non-MFGP}$ = a log difference of variable y for Non-MFGP firm i in year t.

The three different y variables
– a firm's Labor Productivity (LP=Value-added/Employment)
– a firm's Value-added
– a firm's Employment size.

Productivity Spillover Effect

- Impact of MFGPs on Non-MFGP's growth

$$\Delta lny_{it}^{Non-MFGP}$$

$$= \beta_0 + \beta_1 Entry\ rate_{k(t-1)}^{MFGP} + \gamma Entry\ rate_{k(t-1)}^{Non-MFGP} + \rho lny_{i(t-1)}^{Non-MFGP}$$

$$+\delta_i + \delta_t + \varepsilon_{it}$$

Main control variable

$$Entry\ rate_{kt}^{MFGP} = \frac{\sum_j Entry\ rate_{jkt}^{MFGP}}{\#\ of\ MFGP_{kt}},$$

where $Entry\ rate_{jkt}^{MFGP} = \frac{\#\ Entry\ stores\ of\ MFGP_{jkt}}{(\#\ of\ MFGP\ store_{jkt} + \#\ of\ MFGP\ store_{jk(t-1)})/2}$

$Entry\ rate_{kt}^{MFGP}$ is the **industrial average** of store-entry rate of MFGPs in 3-digit industry k in year t.

$Entry\ rate_{jkt}^{MFGP}$ is the store-entry rate of a MFGP firm j in 3-digit industry k in year t. It is measured by the ratio of the number of entered store of firm j in 3-digit industry k in year t to the average number of its existing stores in year $t - 1$ and year t. $Davis\ et\ al.\ (1996)$.

Spillover effect on Productivity of non-MFGPs

- Preliminary result:

Store Entry Rate of MFGPS and Labor Productivity Growth rate of Non-MFGP
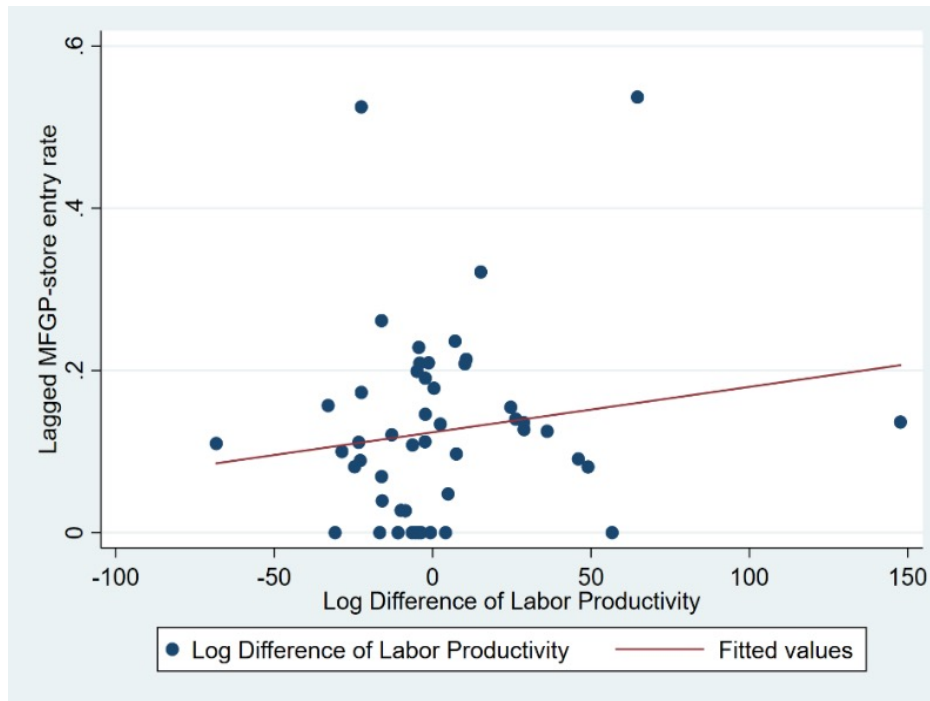
Notes: The figures are calculated from the *SBA* and *CE* data.
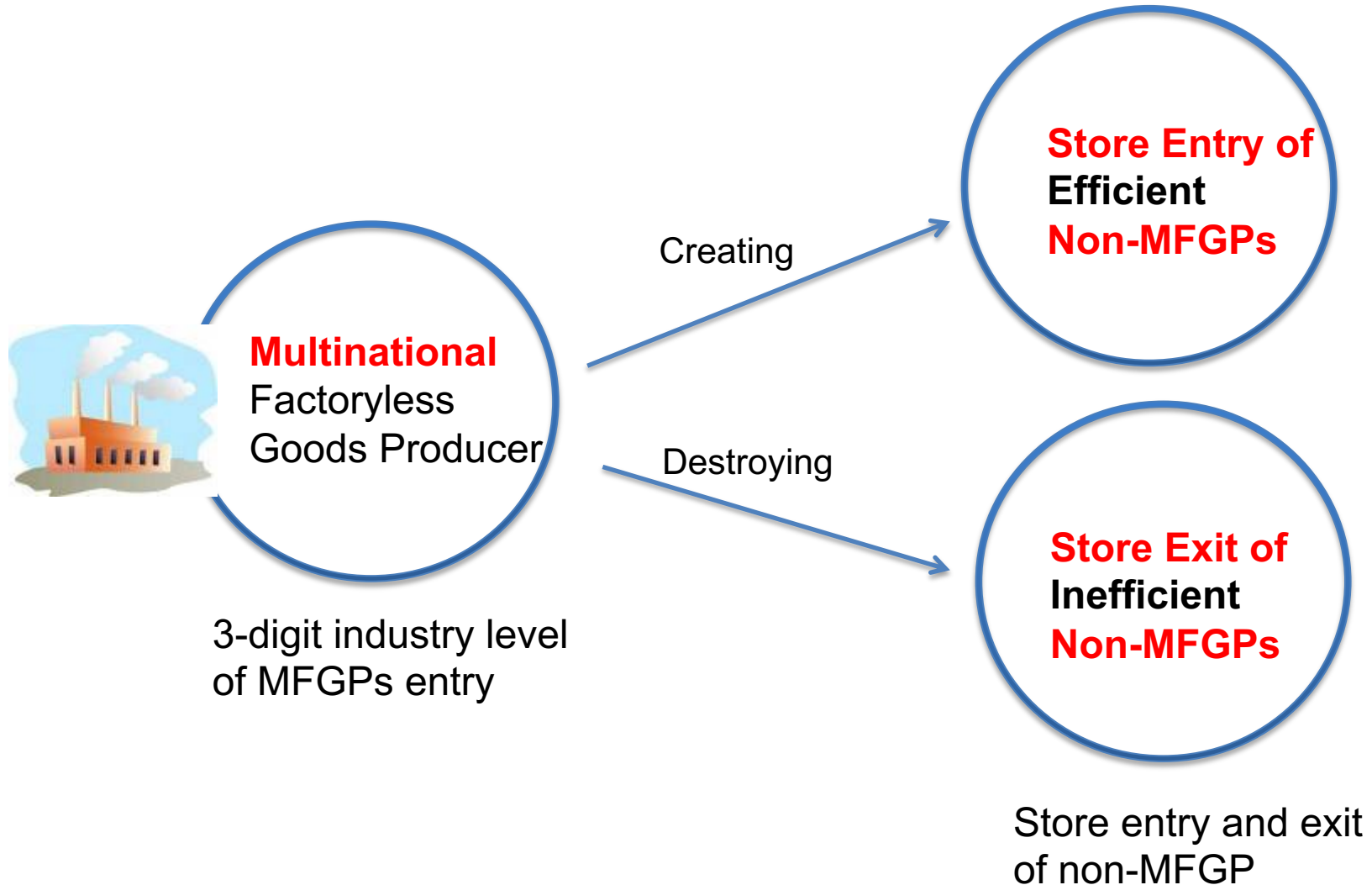
Productivity Spillover Effect

- Impact of MFGPs on Non-MFGP's growth

$$\Delta lny_{it}^{Non-\text{M}FGP}$$
$$= \beta_0 + \beta_1 Entry\ rate_{k(t-1)}^{MFGP} + \gamma Entry\ rate_{k(t-1)}^{Non-\text{M}FGP} + \rho lny_{i(t-1)}^{Non-\text{M}FGP}$$
$$+ \delta_i + \delta_t + \varepsilon_{it}$$

Other control variables

(1) $Entry\ rate_{k(t-1)}^{Non-\text{M}FGP}$ = the industry-level measure for competition degree among Non-MFGPs.

(2) $ln\ y_{i(t-1)}^{Non-\text{M}FGP}$ is included as a firm-level control variable since the already grown firm in year t-1 could be related to having a low chance of growth between year t-1 and t.

(3) We consider the firm-fixed effect as well as time specific effects.

Creative destruction for non-MFGPs

Multinational
Factoryless
Goods Producer

3-digit industry level
of MFGPs entry

Creating →

Destroying →

Store Entry of Efficient Non-MFGPs

Store Exit of Inefficient Non-MFGPs

Store entry and exit
of non-MFGP

Creative Destruction Effect

- Impact of MFGPs on Non-MFGP's entry and exit

$$Store - Entry_{it}^{Non-MFGP} (or\ Store - Exit_{it}^{Non-MFGP}) =$$

$$\beta_0 + \beta_1 Entry\ rate_{k(t-1)}^{MFGP} + \gamma Size_{it} + \delta_i + \delta_t + + \varepsilon_{it}$$

Dependent Variable

$Store - Entry_{it}^{Non-MFGP} (Store - Exit_{it}^{Non-MFGP})$

= 1 if Non-MFGP i in year t opens (closes) at least one store

   0 otherwise

Creative Destruction Effect

- Impact of MFGPs on Non-MFGP's entry and exit

$$Store - Entry_{it}^{Non-MFGP} \ (or \ Store - Exit_{it}^{Non-MFGP}) =$$

$$\beta_0 + \beta_1 Entry \ rate_{k(t-1)}^{MFGP} + \gamma Size_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Main control variable

$$Entry \ rate_{kt}^{MFGP} = \frac{\sum_j Entry \ rate_{jkt}^{MFGP}}{\# \ of \ MFGP_{kt}}$$

Other control Variables

$Size_{it}$= a log of numbers of regular workers

And, firm- and time-fixed effects

Summary Statistics

	Obs.	Mean	Std.	Min.	Max.
Dependent var.					
$\Delta Size_{it}^{Non-MFGP} \times 100$	5276	0.88	38.63	-443.48	461.71
$\Delta \log VA_{it}^{Non-MFGP} \times 100$	4135	2.34	96.68	-560.41	656.85
$\Delta \log LP_{it}^{Non-MFGP} \times 100$	4135	4.84	91.73	-569.43	651.72
$Store - Entry_{it}^{Non-MFGP}$	7149	0.44	0.50	0	1
$Store - Exit_{it}^{Non-MFGP}$	7149	0.25	0.43	0	1
$Store - Entry_{i(t-1,t)}^{Non-MFGP}$	7149	0.59	0.49	0	1
$Store - Exit_{i(t-1,t)}^{Non-MFGP}$	7149	0.32	0.47	0	1
Main Explanatory var.					
$Entry\ rate_{k(t-1)}^{MFGP}$	4449	0.16	0.10	0	0.54
Control var.					
$Entry\ rate_{k(t-1)}^{Non-MFGP}$	5596	0.21	0.08	0	0.56
$\ln Size_{it}^{Non-MFGP}$	7149	4.38	1.22	0.00	10.26
$\ln Size_{i(t-1)}^{Non-MFGP}$	5276	4.45	1.19	0.00	10.24
$\ln VA_{i(t-1)}^{Non-MFGP}$	4998	7.93	1.67	1.11	14.35
$\ln LP_{i(t-1)}^{Non-MFGP}$	4998	3.41	1.31	-3.00	10.39

Note. The figures are calculated from SBA and CE data for fiscal years 2008-2014. $Store - Entry_{i(t-1,t)}^{Non-MFGP}$ and $Store - Exit_{i(t-1,t)}^{Non-MFGP}$ are the entry and exit dummies for two years t-1 and t. ln Size = the log of the number of workers. ln VA = the log of the value-added. ln LP = the log of the value-added per worker.

Spillover Effect from MFGP to Non-MFGP

Table 5: Fixed Effect Model for Growth Rate of Non-MFGPs

	$\Delta \ln LP_{it}^{Non-MFGP} \times 100$	$\Delta \ln VA_{it}^{Non-MFGP} \times 100$	$\Delta \ln Size_{it}^{Non-MFGP} \times 100$
	(1)	(2)	(3)
$Entry\ rate_{k(t-1)}^{MFGP}$	**69.92****	**57.27***	**-11.24**
	(30.14)	(30.55)	(9.368)
$Entry\ rate_{k(t-1)}^{Non-MFGP}$	24.10	20.10	-2.660
	(30.47)	(29.98)	(8.221)
$\ln LP_{i(t-1)}^{Non-MFGP}$	-107.5***		
	(3.418)		
$\ln VA_{i(t-1)}^{Non-MFGP}$		-104.6***	
		(3.759)	
$\ln Size_{i(t-1)}^{Non-MFGP}$			-84.26***
			(3.624)
Observations	2,717	2,717	3,480
R-squared	0.517	0.490	0.399
Year FE	yes	yes	yes
Firm FE	yes	yes	yes

Note. The figures are calculated from SBA and CE data for fiscal years 2008-2014. Heteroscedasticity and autocorrelation robust error in parentheses. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

Result 1

- Entries of MFGPs in a market increase the labor productivity (LP) and value-added (VA) of Non-MFGP firms, but not their employments (L).
- The LP is defined as VA/L. So, the labor productivity of non-MFGPs are increased through an increase in value-added, but not a decrease in L.
- The non-MFGPs do not downsize their employed workers.
- Their VA and LP are increased to due to the entry of MFGPs in the same market.

→ **Spillover effect**

Creative Destruction Effect

Table 6: LPM Estimation for Store-Entry and Exit Probability of Non-MFGPs

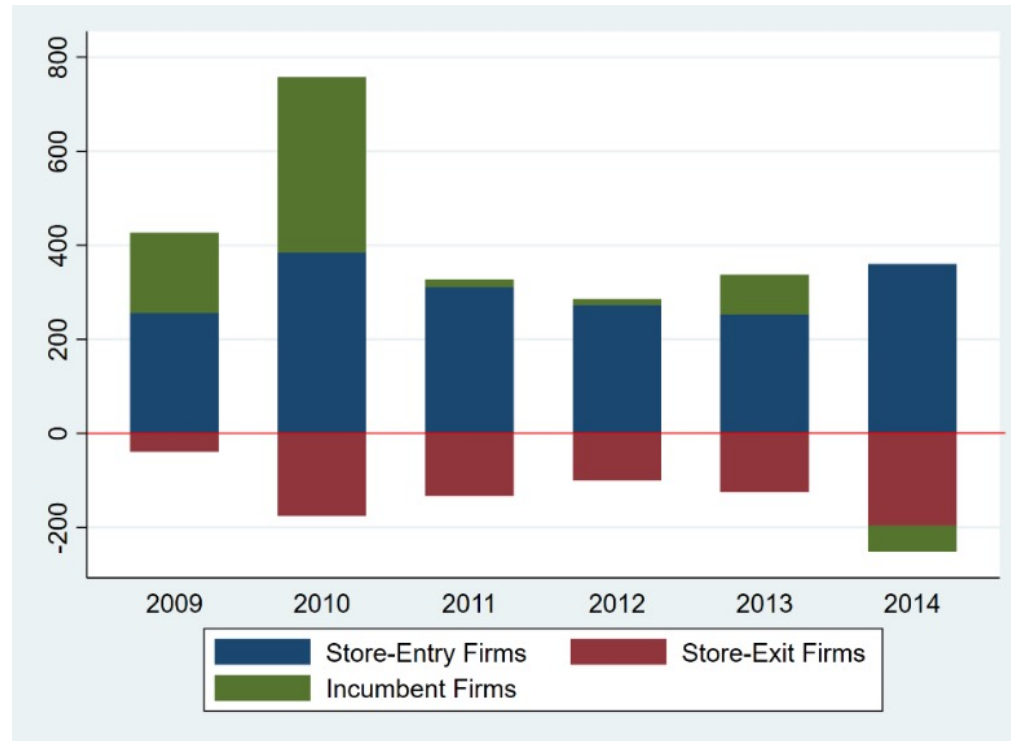|	Store-Entry or Exit for t year		Store-Entry or Exit for t-1 and t year	
	$Store-Entry_{it}^{Non-MFGP}$	$Store-Exit_{it}^{Non-MFGP}$	$Store-Entry_{i(t-1,t)}^{Non-MFGP}$	$Store-Exit_{i(t-1,t)}^{Non-MFGP}$
	(1)	(2)	(3)	(4)
$Entry\ rate_{k(t-1)}^{MFGP}$	**0.263****	**0.0491**		
	(0.117)	(0.0985)		
$Entry\ rate_{k(t-2)}^{MFGP}$			**0.247****	**0.0940**
			(0.108)	(0.0970)
$\ln Size_{it}^{Non-MFGP}$	0.0414	-0.0357	0.0589**	-0.0291
	(0.0268)	(0.0226)	(0.0276)	(0.0249)
Constant	0.493***	0.349***	0.541***	0.389***
	(0.114)	(0.0963)	(0.118)	(0.106)
Observations	4,444	4,444	3,516	3,516
R-squared	0.077	0.014	0.084	0.029
Firm FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes

Note. The figures are calculated from SBA and CE data for fiscal years 2008-2014. $Store-Entry_{ik(t-1,t)}^{Non-MFGP}$ and $Store-Exit_{ik(t-1,t)}^{Non-MFGP}$ are the entry and exit dummies for two years t-1 and t. Heteroscedasticity and autocorrelation robust error in parentheses. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

Creative Destruction Effect

Shares of Value-Added for Store-Entrants, Store-Exiters and Store-Incumbents of non-MFGPs

Non-MFGPs

Store-Entry is the key force of the **increase in value-added of Non-MFGPs**

Note: The figures are calculated from SBA and CE data. The unit is KRW 1 billion for y-axis, and years for x-axis.

Creative Destruction Effect

Table 7: Probit Estimation for Store-Entry and Exit Probability of Non-MFGPs

	Store-Entry or Exit for t year (dy/dx)		Store-Entry or Exit for t-1 and t year (dy/dx)	
	$Store - Entry_{it}^{Non-MFGP}$	$Store - Exit_{it}^{Non-MFGP}$	$Store - Entry_{i(t-1,t)}^{Non-MFGP}$	$Store - Exit_{i(t-1,t)}^{Non-MFGP}$
	(1)	(2)	(3)	(4)
$Entry\ rate_{k(t-1)}^{MFGP}$	**0.155**	**0.0929**		
	(0.119)	(0.0583)		
$Entry\ rate_{k(t-2)}^{MFGP}$			**0.215****	**0.113**
			(0.0935)	(0.0805)
$\ln Size_{it}^{Non-MFGP}$	0.0642***	0.116***	0.0669***	0.143***
	(0.0183)	(0.00719)	(0.0156)	(0.00973)
Observations	4,444	4,444	3,516	3,516
Industry 3-digit FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes

Note. The figures are calculated from SBA and CE data for fiscal years 2008-2014. $Store - Entry_{ik(t-1,t)}^{Non-MFGP}$ and $Store - Exit_{ik(t-1,t)}^{Non-MFGP}$ are the entry and exit dummies for two years t-1 and t. Heteroscedasticity and autocorrelation robust error in parentheses. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

Table 8: Logit Estimation for Store-Entry and Exit Probability of Non-MFGPs

	Store-Entry or Exit for t year		Store-Entry or Exit for t-1 and t year	
	$Store-Entry_{it}^{Non-MFGP}$	$Store-Exit_{it}^{Non-MFGP}$	$Store-Entry_{i(t-1,t)}^{Non-MFGP}$	$Store-Exit_{i(t-1,t)}^{Non-MFGP}$
	(1)	(2)	(3)	(4)
$Entry\ rate_{k(t-1)}^{MFGP}$	1.273*	0.637		
	(0.696)	(0.937)		
$Entry\ rate_{k(t-2)}^{MFGP}$			1.616*	1.010
			(0.867)	(1.042)
$\ln Size_{it}^{Non-MFGP}$	0.236	-0.167	0.477**	-0.223
	(0.155)	(0.161)	(0.231)	(0.211)
Observations	2,822	1,894	1,595	1,186
Firm FE	yes	yes	yes	yes
Industry 3-digit FE	yes		yes	
		yes		yes
Year FE	yes	yes	yes	yes

Note. The figures are calculated from SBA and CE data for fiscal years 2008-2014. $Store-Entry_{i(t-1,t)}^{Non-MFGP}$ and $Store-Exit_{i(t-1,t)}^{Non-MFGP}$ are the entry and exit dummies for two years t-1 and t. Heteroscedasticity and autocorrelation robust error in parentheses. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

Creative Destruction Effect

Result 2

- Entry of MFGPs in a market increases the store-entry of non-MFGPs in the same market, but not affects the exit of non-MFGPs.

- The entry of MFGPs increases the varieties of products and expand the demand for consumers. It will increase the profitability of the markets and thus give incentives for non-MFPGs to enter.

- The entry of MFGPs do not necessarily destroy for non-MFGPs. It may be due to the buyers' preference.

→ **Creation effect, but not destruction effect**.

Concluding remarks

(1) Service GVC matters for domestic spillover.

The effect of deepened GVC is not limited on manufacturing sector, but the impact of the GVC could be also found in service sectors such as the wholesale and retail.

This suggests that domestic industrial responses from the noticeable change in GVC system need to be analyzed beyond the manufacture sector.

(2) Limitation

- Could not account for a small service firms in retail industry due to the limit of data
- Other mechanism of productivity increase for non-MFGPs should be also examined.
  (a) in-store service by educated sales workers
  (b) customer-friendly display methods in a store
  (c) Inventory technology of Non-MFGPs
- → some of them may have been influenced by MFGPs.